

Application No. 10/636,142  
Amendment filed with RCE

Customer No. 01933

Listing of Claims:

Claims 1-6 (Canceled).

7. (New) A focus stabilizing apparatus comprising:  
an objective lens arranged underneath an observation sample  
so as to face the observation sample;  
a fixing base;  
5 a sample base on which the observation sample is placed;  
a focus adjusting mechanism, which continuously extends  
between the sample base and the fixing base and surrounds the  
objective lens, for varying a distance along an optical axis of  
the objective lens between the sample base and the fixing base;  
10 a minute movement table to which the objective lens is  
fixed;  
parallel springs situated between the fixing base and the  
minute movement table to allow the minute movement table to be  
moved in an optical axis direction of the objective lens;  
15 an actuator provided between the fixing base and the minute  
movement table to minutely displace the minute movement table in  
the optical axis direction of the objective lens;  
a displacement sensor provided between the fixing base and  
the minute movement table for detecting a displacement amount of  
20 the objective lens; and

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a controller which allows the actuator to perform an  
extending/contracting operation based on a detection output of  
the displacement sensor to control the objective lens and bring  
the objective lens to a just-in-focus position relative to the  
25 observation sample.

8. (New) The focus stabilizing apparatus according to  
claim 7, wherein when the objective lens is focused on the  
observation sample by the focus adjusting mechanism, the control  
means keeps the objective lens focused on the observation sample.

9. (New) The focus stabilizing apparatus according to  
claim 7, wherein the focus stabilizing apparatus is provided in  
an inverted microscope, and the fixing base is fixed to a  
revolver of the inverted microscope.

10. (New) A focus stabilizing apparatus comprising:  
an objective lens arranged underneath an observation sample  
so as to face the observation sample;  
a fixing base;  
5 a stage on which the observation sample is placed;  
a minute movement table to which the objective lens is  
fixed;

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parallel springs situated between the fixing base and the minute movement table to allow the minute movement table to be moved in an optical axis direction of the objective lens;

an actuator provided between the fixing base and the minute movement table to minutely displace the minute movement table in the optical axis direction of the objective lens;

a displacement sensor provided between the stage and the objective lens for detecting a displacement amount of the objective lens; and

a controller which allows the actuator to perform an extending/contracting operation based on a detection output of the displacement sensor to control the objective lens and bring the objective lens to a just-in-focus position relative to the observation sample.

11. (New) The focus stabilizing apparatus according to claim 10, wherein said control means includes:

a memory section for storing an output of the displacement sensor corresponding to a just-in-focus state between the observation sample and a focal point of the objective lens;

a comparing section for comparing an output of the displacement sensor and an output of the displacement sensor stored in the memory section; and

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10 a control section for outputting an electrical signal for  
canceling a distance variation between the observation sample and  
the objective lens based on a result of comparison by the  
comparing section.

12. (New) The focus stabilizing apparatus according to  
claim 10, wherein the focus stabilizing apparatus is provided in  
an inverted microscope, the fixing base is fixed to a revolver of  
the inverted microscope, and the stage is fixed on the inverted  
microscope above the revolver.

13. (New) The focus stabilizing apparatus according to  
claim 10, wherein the displacement sensor comprises a target  
provided in a vicinity of an end of the objective lens, and a  
detector provided at the stage.

14. (New) A focus stabilizing apparatus comprising:  
an objective lens arranged underneath an observation sample  
so as to face the observation sample;  
a fixing base;  
5 a stage on which the observation sample is placed;  
a minute movement table to which the objective lens is  
fixed;

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10 a movement mechanism which is provided between the fixing  
base and the minute movement table, and which allows the minute  
movement table to move in an optical axis direction of the  
objective lens;

15 a drive mechanism which is provided between the fixing base  
and the minute movement table, and which is adapted to minutely  
displace the minute movement table in the optical axis direction  
of the objective lens;

a displacement sensor provided between the stage and the  
objective lens to detect a displacement amount of the objective  
lens; and

20 a controller which allows the drive mechanism to operate  
based on a detection output of the displacement sensor to control  
the objective lens and to bring the objective lens to a just-in-  
focus position relative to the observation sample.

15. (New) The focus stabilizing apparatus according to  
claim 14, wherein the focus stabilizing apparatus is provided in  
an inverted microscope, the fixing base is fixed to a revolver of  
the inverted microscope, and the stage is fixed on the inverted  
microscope above the revolver.